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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,883	03/31/2004	Kevin J. Orvek	10559-932001	7571

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FISH & RICHARDSON, PC  
P.O. BOX 1022  
MINNEAPOLIS, MN 55440-1022

EXAMINER
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STARK, JARRETT J

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/814,883

Applicant(s)

ORVEK, KEVIN J.

Examiner

Jarrett J. Stark

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,9-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 5,6,8,13,17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed 10/31/2006 have been fully considered but they are not persuasive.

In response to applicant's arguments the references do not disclose or suggest at least the features of "a pair of exposed conductive lines defining a channel configured to capture at least one particle having an associated diameter" and/or "the channel having a pitch that is a least equal to or smaller than the diameter of the at least one particle to be captured"

As the claims read, the claims are not limited to a specific particle size, therefore the pitch is not limited to a specific size. It would be obvious to one of ordinary skill in the art that Shah's detector consisting of electrodes with a pitch of 0.5mm could be used to trap a particle with a diameter of 0.5mm or greater.

It is also noted that Shah's detector detects the particulates by measuring a short across the two electrodes, therefore it is obvious that the object creating the short has to have a diameter equal to or greater than the pitch in order to create an electrical connection.

Merely adjusting the pitch between electrodes does not change the basic structure of the detector, which is being claimed. Adjusting the pitch in order to detect a desired particle size is a method of use for the particular structure.

In re Kuehl, 177 USPQ 250 (CCPA 1973)

When considering a method of use claim (steps for operating a specific structural assembly), patentable weight is given to the structure on which the claimed process is carried out in determining the obviousness of that process.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal value for the pitch through routine experimentation and optimization to obtain optimal or desired device performance because the pitch is a result-effective variable and there is no evidence indicating that it is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05

In re Rose, 105 USPQ 237 (CCPA 1955) Appellant argues that this claim recites that the package is of appreciable size and weight so as to require handling by a lift truck whereas Wheless and Denison packages can be lifted by hand. We do not feel that this limitation is patentably significant since it at most relates to the size of the article under consideration, which is not ordinarily a matter invention. *In re Yount*, 36 C.C.P.A. (Patents) 775, 171 F.2d 317, 80 USPQ 141.

Any differences in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

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Appellants have the burden of explaining the data in any declaration they proffer as evidence of non-obviousness. *Ex parte Ishizaka*, 24 USPQ2d 1621, 1624 (Bd. Pat. App. & Inter. 1992).

An Affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

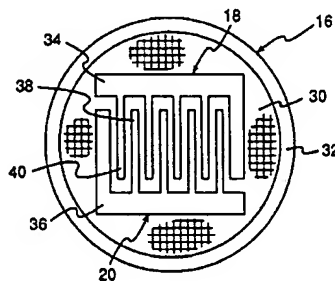


FIG. 2

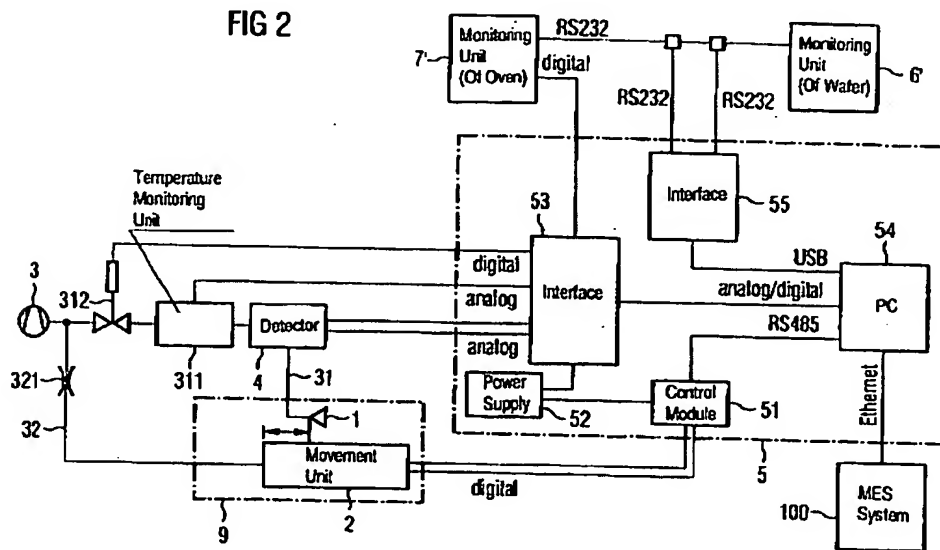
In response to the arguments that Shah does not disclose "a pair of exposed conductive lines defining a channel." As shown, Shah's figure 2 clearly depicts two conductive electrodes (lines) 34 & 36. These lines have to be exposed, if the lines are not exposed then it would be impossible for a particle to create a short and the detector would not work.

### ***Allowable Subject Matter***

**Claims 5,6,8,13,17, & 18** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Claim Rejections - 35 USC § 103***

**Claims 1,2,4,7,9-12,14-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Storbeck et al. (US 6,928,892) in view of Shah (US 5,247,827).

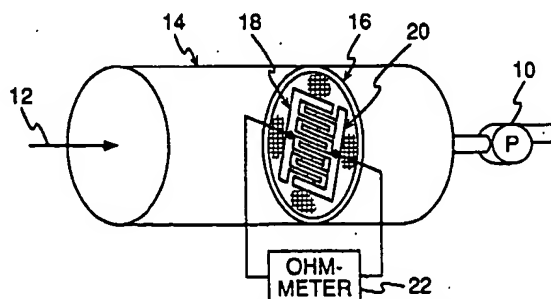


**Regarding claim 1, Storbeck discloses an apparatus comprising: an vacuum chamber containing a particle detecting integrated circuit. (Storbeck, Figure 2-ref# [4] & Abstract)**

Storbeck discloses a particle detector however, does not expressly disclose the particle detecting integrated circuit including a device having a pair of exposed conductive lines defining a channel (Shah, Fig. 2 shown above show that the electrode/lines define a channel) configured to capture at least one particle having an associated diameter, the channel having a pitch that is at least equal to or smaller than the diameter of the at least one particle to be captured.

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Shah discloses the particle detecting integrated circuit including a device having a pair of exposed conductive lines spaced at a critical pitch corresponding to particles of interest. (Shah, Figure 1 – also see above response to arguments)



The two references are analogous art because they are from a similar problem solving area of particle detection inside a semiconductor processing chamber during manufacturing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a particle detector with two exposed electrodes to detect particles inside the chamber. Therefore, it would have been obvious to combine Storbeck with Shah to obtain the invention as specified. (Shah, Col. 1, 62-66)

In semiconductor fabrication, contamination, for example by particles or foreign substances, constitutes a great risk with the consequences of reducing the quality and total failure of the electronic components. (Storbeck, Col. 1, 15-18)

The invention may be summarized as a method and apparatus for detecting the conductivity of particulate matter, such as dust, carried in air or other gases. Air is pumped through a filter having a mesh size sufficiently small to filter out the particles. An interdigitated electrode structure is formed on the upstream side of the filter. The conductivity of the dust is determined by measuring the electrical resistance between the electrodes. (Shah, Col. 1, 62-66)

**Regarding claim 2, Storbeck in view of Shah, discloses the apparatus of claim 1 further comprising a computer system linked to the particle detecting integrated circuit. (Storbeck, Col. 8, 34-43)**

**Regarding claim 4, Storbeck in view of Shah, discloses the apparatus of claim 1 wherein the particle detecting integrated circuit includes a plurality of devices. (Shah, Figure 1)**

**Regarding claim 7, Storbeck in view of Shah, discloses the apparatus of claim 2 wherein the computer system detects a change in current when a metallic particle shorts the pair of exposed conductive lines.**

It is inherent that a metallic (conductive) particle comes in contact with two previously electronically isolated electrodes, the metallic particle will create a path for an electrical current which will "short" the conductive lines.

**Regarding claim 9, Storbeck in view of Shah, discloses an apparatus comprising: a mask stage in a vacuum chamber of semiconductor processing equipment; a particle detecting integrated circuit embedded in the mask stage (Storbeck, Figure 2-ref# [4] & Abstract)**

The particle detecting integrated circuit containing a device having a pair of conductive lines exposed to a local vacuum environment, the pair of lines defining a channel configured to capture at least one particle having an associated diameter, the channel having a pitch that is at least equal to or smaller than the diameter of the at



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least one particle to be captured.. (Shah, Figure 1 – also see above response to arguments)

**Regarding claim 10,** Storbeck in view of Shah, discloses the apparatus of claim 9 further comprising a computer system linked to the particle detecting integrated circuit. (Storbeck, Col. 8, 34-43)

**Regarding claim 11,** Storbeck in view of Shah, discloses the apparatus of claim 10 wherein the pair of conductive lines have an applied voltage. (Shah, Figure 1- Ohm meter)

**Regarding claim 12,** Storbeck in view of Shah, discloses the apparatus of claim 11 wherein the computer system detects a change in current when a metallic particle shorts the pair of conductive lines. (Shah, Figure 1- Ohm meter- zero resistance)

**Regarding claim 14,** Storbeck in view of Shah, discloses the apparatus of claim 10 wherein the computer system is semiconductor component circuitry.

It is inherent that computer systems are “semiconductor component circuitry”  
EXAMPLES: the computer’s CPU and memory are semiconductor component circuitry, with out them there is no computer.

**Regarding claim 15,** Storbeck in view of Shah, discloses the apparatus of claim 1Q wherein the computer system is off-chip circuitry. . (Storbeck, Figure 2-ref# [54])

**Regarding claim 16,** Storbeck in view of Shah, discloses the apparatus of claim 9 wherein the particle detecting integrated circuit comprises a plurality of devices.  
(Shah, Figure 1)

**Claim 3 is** rejected under 35 U.S.C. 103(a) as being unpatentable over Storbeck et al. (US 6,928,892) in view of Shah (US 5,247,827) in further view of Smith (US 2004/0031928)

**Regarding claim 3,** Storbeck in view of Shah, discloses the apparatus of claim 1  
The combined references do not disclose wherein the particle detecting integrated circuit includes a remote-controlled movable cover protecting the device.

It is however notoriously well known in the art to incorporated movable covers for particle detectors. For example, Smith discloses a particle detector with a movable cover. It is disclosed that the cover can be moved by hand or a remote mechanism in order to prevent additional particles form reaching the detector. (see smith claims 7&8)

In re Venner, 120 USPQ 192 (CCPA 1958)

Furthermore, it is well settled that it is not "invention" to broadly provide a mechanical or automatic means to replace manual activity which has accomplished the same result. In re Rundell, 18 CCPA 1290, 48 F.2d 958, 9 USPQ 220.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jarrett J. Stark whose telephone number is (571) 272-6005. The examiner can normally be reached on Monday - Thursday 7:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJS  
November 6, 2006

  
Fernando L. Toledo  
Primary Examiner  
Art Unit: 2823